On the Sustainability of Open Borders in a Fiscally Heterogeneous Union

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Latest version: Feb. 14, 2021

First Draft

1 Summary

In this simple note I study, in a very stylized way, the effect that opening up borders has on the welfare of low and high-tax countries. I do so by adapting the model in Miyagiwa (1991) to address the question of taxation. Using the simple analysis, I conclude with a few thoughts on the European Union and its sustainability in its current form.

2 The Closed Economy

Consider an economy in which there is a unit mass of people with ability $q \in [0, 1]$ distributed according to distribution $f(q)$. People are born and carry their ability throughout their life. Agents inelastically provide labor according to their ability, namely $y = q$. The government collects revenue through a linear labor income tax τ and redistributes the revenue equally across the population. Because of the competitive firm environment, it follows that workers are simply paid their effective labor supply q minus what the government taxes plus the lump sum transfer equal across agents, that is

$$\text{Earnings}(q) \quad = \quad q(1-\tau) \; + \; T \tag{1}$$

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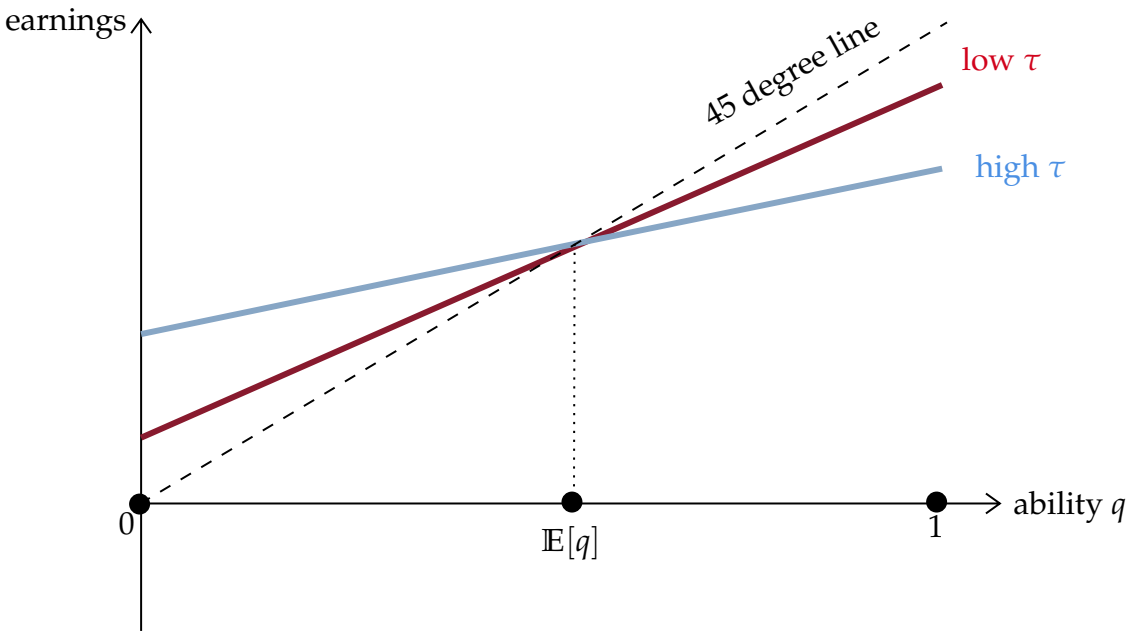
where the size of the lump sum transfer ensures the government balances its budget, that is

$$T \quad = \quad \tau \int_0^1 q f(q)\, dq \; = \tau \mathbb{E}[q] \tag{2}$$

Let us now think about how different tax rates affect different types of agents. Including (2) in (1) gives

$$\begin{aligned} \text{Earnings}(q) \quad &= \quad q(1-\tau) \; + \; \tau \mathbb{E}[q] \\ &= \quad q \; + \; \tau(\mathbb{E}[q] - q) \end{aligned} \tag{3}$$

which is increasing in τ for those workers with $\mathbb{E}[q] - q > 0$, i.e. all workers whose productivity is below average, and decreasing for all those workers with $\mathbb{E}[q] - q < 0$, i.e. all workers whose productivity is above average. This mimics, in an extremely stylized way, the redistributive character of many governments. I display the earnings of worker of different types with a low (red) and high (blue) tax in the below figure. Obviously enough, a higher tax rate is beneficial for the low ability workers and makes high ability workers worse off.



3 The Open Economy

Now rather than one country consider two countries, H and F, identical in every aspect except for the tax rate they impose (assume $\tau_H > \tau_F$). Furthermore, suppose workers can move across countries at a cost m. Because high ability workers are the ones with more resources, they are the most likely to move, and if they move they will move towards the low tax country. For this reason, assume mobility is only possible from H to F[1]. A worker of ability q is indifferent between staying or moving from H to F if the following holds:

$$\begin{aligned} \underbrace{q + \tau_F(\mathbb{E}_F[q] - q) - m}_{\text{wage abroad}} &= \underbrace{q + \tau_H(\mathbb{E}_H[q] - q)}_{\text{wage at home}} \\ \Leftrightarrow \tau_F(\mathbb{E}_F[q] - q) - m &= \tau_H(\mathbb{E}_H[q] - q) \\ \Leftrightarrow \quad \underbrace{\tau_F\mathbb{E}_F[q] - \tau_H\mathbb{E}_H[q] - m}_{\text{increase in subsidy net of moving cost}} &= \underbrace{(\tau_F - \tau_H)q}_{\text{decrease in taxes paid}} \end{aligned} \tag{4}$$

Important to note is that $\mathbb{E}_H[q]$ and $\mathbb{E}_F[q]$ are equilibrium objects which depends on whom migrates. This means that the equilibrium is completely determined by the following equations:

$$\tau_F\mathbb{E}_F[q] - \tau_H\mathbb{E}_H[q] - m = (\tau_F - \tau_H)q_H^* \tag{5}$$

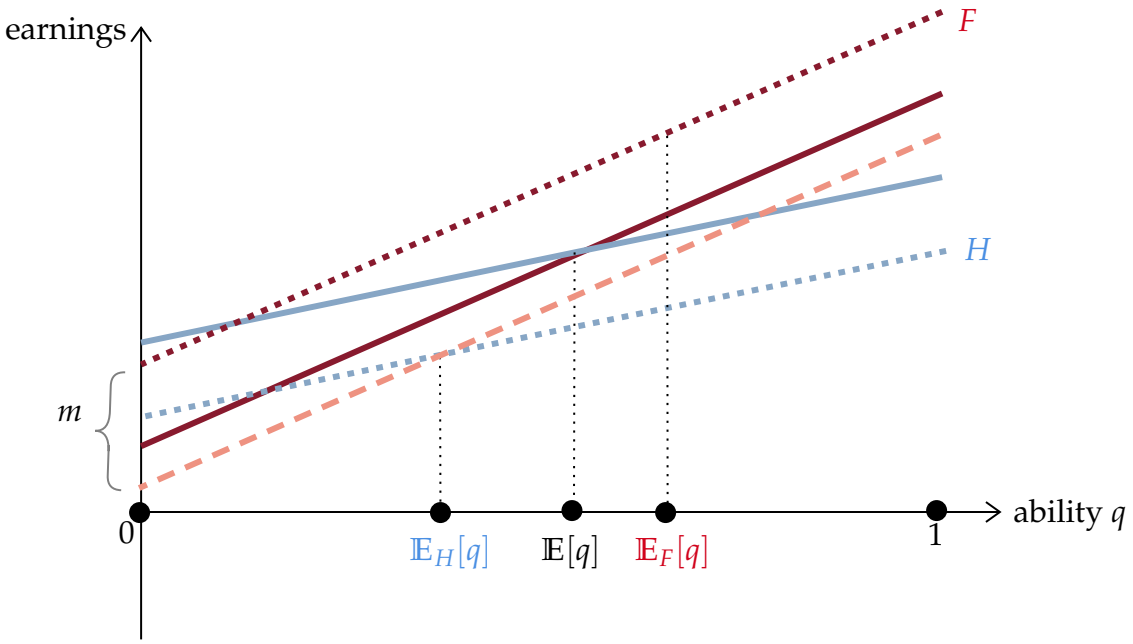
$$\mathbb{E}_H[q] = \int_{\underline{q}}^{q_H^*} qf(q)\,dq \tag{6}$$

$$\mathbb{E}_F[q] = \int_{\underline{q}}^{\bar{q}} qf(q)\,dq + \underbrace{\int_{q_H^*}^{\bar{q}} qf(q)\,dq}_{\text{emigrants to } F} \tag{7}$$

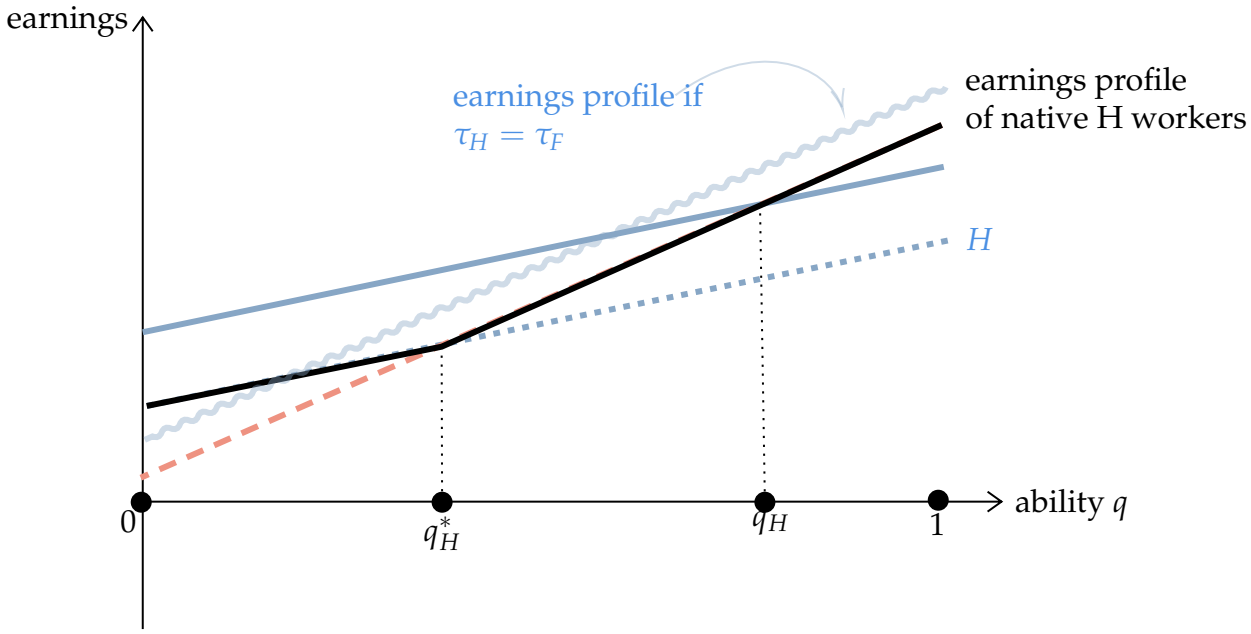
When a worker moves to another country she faces the exact same earnings profile faced by workers in that country except that is now translated down by m.

Consider now the earnings profile faced by H workers. Workers with ability $q \in [\tilde{q}_H, 1]$ will emigrate and be better off with open borders. Those with productivity $q \in [q_H^*, \tilde{q}_H]$ still emigrate because the lower tax and higher subsidy in F is attractive, but would have been better off if the economy had not opened up. Those with low ability $q \in [0, q_H^*]$ are wose off because their subsidy is lower than before (since most of the

[1]Note, there is the possibility that low income workers move to the higher tax country in order to take advantage of the higher welfare in the high-tax country. Allowing this makes for interesting but I think unrealistic general equilibrium dynamics, which is why this scenario is excluded.



revenue coming from the top is gone).



This analysis leads to three points:

1. Those who remain at home are the low-skilled and they suffer a cut in welfare benefits.

2. Of those who leave, the very high-skilled, are strictly better off than they would otherwise been if borders had remained closed.

3. Of those who leave, many leave but are not happy about it! They leave but they would much rather have the economy remain closed. However, because the best and the brightest leave, this pushes down government tax receipts and thus the subsidy everyone receives.

The light wiggly blue line shows the counterfactual income workers would have received if they had simply implemented the same tax rate as F. Comparing the black solid line with the wiggly blue line, it is clear that nearly everybody is worse off in the open economy world if H does not make an adjustment in the tax rate. Of course the caveat is that if H does adjust the tax rate the very poor are worse off than they would have otherwise been.

4 A Look at Europe

The simple model above makes one point clear: the bigger the difference in tax rates and the lower the cost of migration m the more migration there is across countries and in turn, the smaller the share of workers who prefer maintaining the tax difference between the two countries once the economies have opened up. In light of this I ask how can the (integrated) European Union not have seen a convergence in taxation (see Figure 1)? While in the United States, another union in which there is complete free movement across states, the fiscal union can sustain persistent divergence in tax rates across states, this should not be possible in Europe. What this theory implies, however, is that policymakers should not only be worried of how to maintain a monetary union without a fiscal union, but also about how to maintain a union in which labor freely flow across borders without a fiscal union. Are the only options Europe has to have all countries converge, establish a fiscal union, or fail?

5 Bibliography

Miyagiwa, Kaz. "Scale economies in education and the brain drain problem." International Economic Review (1991): 743-759.

Figure 1: Average personal income tax and social security contribution rates on gross labor income by income group. Source: OECD.